

!" #&/

4;O <548G=>3> 70AB>AC20==O ;V:0@AL:>3> 70A>1C

!

!;:04:

4VNGV @5G>28=8: 1 B01;5B:0, 2:@8B0 >1>;>=:>N, 7B>@>?HV ?;O<8AB>W ?;>4V2 ACE89 (Silybum marianum) (70,0:1)(5:AB@035=B 5B0=>; 90 %) 50 <3; 5:AB@0:B ;8<>==8:C :8B09AL:>3> ?;>4V2 ACE89 (!hizandra chinensis) (5,0:1)(5:AB@035=B 5B0=>; 90 %) 40 <3; 5:AB@0:B 0@B8H>:C ?>AV2=>3> ;8ABO ACE89 (Cynara scolymus) (15,0:1)(5:AB@035=B 2>40) 4,6 <3; V=>78BC 40 <3; E>;V=C 1VB0@B@0BC 30 <3; DL-<5BV>=V=C 20 <3; B0C@8=C 20 <3; 4>?>28=8: :0;LFVN 3V4@>D>AD0B, F5;N;>70 :@8AB0;VG=0, ?>2V4>=, <03=VN AB50@0B, 3V?@> <5;>70, B8B0=C 4V>:A84 (171), ?>;V5B8;5=3;V:>;L, B0;L:, 4V0<0=B>289 A8=V9 (133), 2VA: :0@=0C1AL:89.

V:0@AL:0 D>@<0. "01;5B:8, 2:@8BV >1>;>=:>N.

A=>2=V DV78:>-EVABV: :>@8G=52V 7 2:@0?;5==O<8 :@C3;V 42>>?C;;V B01;5B:8, 2:@8BV >1>;>=:>N 1;0:8B=>3> :>;L>@C.

\$0@<0:>B5@0?52B8G=0 3@C?0. 0A>18, I> 70AB>A>2CNBLAO 4;O ;V:C20==O 70E2>@N20=L ?5GV=:8 V 6>2G>282V4=8E H;OEV2. 5?0B>B@>?>V ?@5?0@0B8. >4 "% 05.

\$0@<0:>;>3VG=V 2;0AB82>ABV.

\$0@<0:>48=0

D5:B ?@5?0@0BC 7C<>2;5=89 4VTN >:@5<8E :>=5=BV2 ;V:0@AL:>3> 70A>1C.

:B82=8< V=3@54VT=B>< T ACD;02>=>W4V2, I> =07820TBLAO A8;V<0@8=, >A=>2=8< :>=5=B<< O:>W T A8;V1V=V=.

!8;V1V=V= <>65 ?V428IC20B8 @V25=L 3;CB0BV>=C C ?5GV=FV =0 50 %. ;CB0BV>= 70E8I0T ;;VB8=8 2V4 4VW 2V;L=8E @048:0;V2. !8;V1V=V= 70E8I0T 35?0B>F8B8 B0 5@8B@>F8B8, 70E8I0T ?5GV=:C 2V4 B5B@0E;>@842C3;52>4C B0 5B0=>;C, 70E8I0T ;;VB8=8 ?5GV=:8, 70?>1V30NG8 2?;82C B>:A8G=8E @5G>28=, AB8B5W=C 4;O ?@8A:>@5==O @535=5@0FVW B0 CB2>@5==O ;;VB8= ?5GV=:8.

8<>=8: :8B09AL:89 ?V428ICT =0:>?8G5==O 3;V:>35=C C ?5GV=FV. 0T 35?0B>?@>B5:B>@=89 5D5:B, AB8F8BV2.

@B8H>: AB82GV, 7=86CT @V25=L E>;5AB5@8=C 2 :@>2V, AB8F8BV2.

=>78B A?@8OT 282545==N 68@V2 V7 ?5GV=:8. V4V3@0T 7=0G=C @>;L C ?@>4C:C20==V ;5F8B8=C. %>;V=C 1VB0@B@0B A?@8OT 5;5AB5@8=C, 70?>1V30NG8 >AV40==N 9>3> =0 ABV=:0E AC48=.

5BV>=V=. &O 0:8A;>B0 ?V4B@8:A840=B. "0:>6 A?@8OT ?V4B@8<0==N >?B8<0;L=>3> AB0=C ?5GV=:8 H;OE>< 7<5=H5==O 2=0 4VT O: :0B0;V70B>@ E>;V=C B0 V=>78BC, ?>A8;NNG8 WE 4VN.

=>78B, E>;V= V <5BV>=V= @07>< 15@CBL CG0ABL C ?5@5@>1FV 68@V2 C ?5GV=FV.

"0C@8= A?@8OT B@02;5==N V ?@>4C:C20==N 6>2GV C ?5GV=FV, A?@8OT @>715?;5==N

E>;5AB5@8=C. >:@0ICT DC=:FVN 6>2G=>3> < CB2>@5==O B0C@>E>;0BC V7 6>2G=8E :8A;>B;

B0C@>E>;0B A?@8OT 1V;LH 5D5:B82=>;5AB5@8=C 7 6>2GN. "0C@8= F5 ;;NG>289 :>=5=B 6>2G=8E :8A;>B, V 2V= 2V4V3@0T 7=0G=C @>;L C 70157?5G5==V >?B8<0;L=>W @>1>B8 ?5GV=:8, 2V=

=5>1EV4=89 4;O 282545==O B>:A8G=8E EV28= V ?@>4C:BV2 >1@30=V7

\$0@<0:>:V=5B8:0. 5 4>A;V46C20;0AL.

;V=VG=V E0@0:B5@8AB8:8.

>:070==O.

%@>=VG=89 35?0B8B, B>:A8G=V C@065==O ?5GV=:8, E@>=VG=89 =5:0;L:C;L>7=89 E>;5F8AB8B, 48A:V=57VO 6>2G=8E H;OEV2 70 3V?>:V=5B8G=8< B8?>

@>B8?>:070==O.

V428I5=0 GCB;82VABL 4> :>=5=BV2 ?@5?0@0BC, @>A;8= @>48=8 A:;04=>F2VB8E (Asteraceae).

5?@>EV4=VABL 6>2G=8E (>1BC@0FV9=0 6>2BO=8FO) 01> A5G>282V4=8E H;OEV2; 6>2G>:0

<O=0 E2>@>10; 3>AB@V 70E2>@N20==O =8@>;, ?5GV=:8, 6>2G=8E V A5G>28E H;OEV2;

3>AB@89 35?0B8B, 3>AB@0 ?5GV=:>20 =54>AB0B=VABL, BO6:0 =8@:>20 B0 ?5GV=:>20 =54>AB0B=VABL; 28@07:>20 E2>@>10 H;C=:0 7 ?V428I5=>N :8A;>B=VABN C AB04VW 703>AB@5==O; ?V428I5=0 71C4;82VABL, 157A>==O; 0@B5@V0;L=0 3V?5@B5=7VO, ?>@CH5==O A5@F52>W 4VO;L=>ABV; 3>AB@V V=D5:FV9=V 70E2>@N20==O, 3>AB@V >B@CT==O @V7=>W 5BV>;>3VW; 5?V;5?AVO.

70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9.

70T<>4VO !V@V=C 7 V=H8<8 70A>10<8 =52V4><0, ?@>B5 A;V4 2@0EC20B8 <>6;82C 270T<>4VN :> =5=BV2 ?@5?0@0BC 7 V=H8<8 70A>10<8. !8;V<0@8= ACBBT2> =5 2?;820T =0 D0@<0:>48=01V2. @8 >4=>G0A=>AC20==V A8;V<0@8=C V ?5@>@0;L=8E :>=B@0F5?B82=8E 70A>1V2 B0 ?@5?0@0BV2, I> 70AB>A>2CNBLAO ?@8 5AB@>35=700 @0EC=>: ?@83=VG5==O A8AB5<8 F8B>E@>1V2 (>20AB0B8=); 0=B8?A8E>B8G=8E ;V:0@AL:8E 70A>1V2 (4V075?0<, 0;?@>7>;0<, ;>@075?0<); ?@>B83@81:>28E ;V:0@AL:8E 70A>1V2 (:5B>:>=07>); 45O:8E ?@5?0@0BV2 4;O ;V:C20==O @0:C (2V=1;0AB8=); 0=B80;5@3VG=8E ;V:0@AL:8E 70A>1V2 (D5:A>D5=048=), 0=B8:>03C;O=BV2 (:;>?V4>3@5;L, 20@D0@8=).

>A;8==V ?@>4C:B8, I>

8<>==8: :8B09AL:89 T0=B03>=VAB< A=>4V9=8E, A540B82=8E 70A>1V2, B@0=:2V;V70B>@V2, =59@>;5?B8:V2. 8<>==8: :8B09AL:89 <>65 ?V428IC20B8 2A<:BC20==O B0:@>;V

@B8H>: <>65 ?>A;01;N20B8 B5@0?52B8G=89 5D5:B 0=B8:>03C;O=BV2 B8?C :C<0@8=C (D5=?@>:C <>=C, 20@D0@8=C), I> ?>B@51CT A?5FV0;L=>W :>@5:FVW 4>78 F8E ?@5?0@0BV2.

@8 >4=>G0A=>AC20==V ?@5?0@0BC 7 3V?>07>B5

0AB>AC20==O <5BV>=V=C C 710;0=A>20=>H5==V 7 V=H8<8 0:8A;>B0<8 70?>1V30T 9>3> B>:A8G=V9 4VW.

"0C@8= AC

@5?0@0B G8=8BL 4VC@5B8G=C 4VN, ?V428ICT 284V;5==O =0B@VN V E;>@84C, <>65 ?V4A8;N20B8 3V?5@3;V:51V2, I> ?V428ICNBL @V25=L 3;N:>78 2 :@>2V.

A>1;82>ABV 70AB>AC20==O.

@0E>2CNG8 =0O2=VABL C A;:04V ?@5?0@0BC ;8<>==8:0 :8B09AL:>3>, 9>3> AB8

@8 E@>=VG=V9 =8@:>2V9 =54>AB0B=>ABV A;V4 1CB8 >15@56=8<8 ?@8 70AB>AC20==V C 72O7:C 7 =5157?5:>N 28=8:=5==O 3V?5@07>B5

@0E>2CNG8 =0O2=VABL C A;:04V ?@5?0@0BC B0C@8=C, A;V4 ?@>2>48B8 :>@5:FVN 4>78

A5@F528E 3;V:>784V2 70;56=> 2V4 GCB;82>ABV ?0FVT=BV2 4> A5@F528E 3;V:>784V2.

30AB@>57>D0350;L=V9 @5D;N:A=V9 E2>@>1V.

'5@57 <>6;8289 5AB@>35=>?>4V1=89 5D5:B A8;V<0@8=C ?@5?0@0B A;V4 70AB>A>2C20B8 7

>15@56=VABN ?0FVT=B0< 7 3>@<>=0;L=8<8 ?>@CH5==O<8 (5=4<5B@V>7, <0 <0B:8, :0@F8=><0 <> ;>G=>W 70;>78, OTG=8:V2 V <0B:8, :0@F8=><0 ?5@542>W 70;>78). # F8E 28?04:0E =5>1EV4=0

:>=AC;LB0FVO 7 ;V:0@5

28?04:C @>728B:C 6>2B0=8FV =5>1EV4=> ?@>:>=AC;LBC20B8AO 7 ;V:0@5< 4;O ?@>2545==O :>@5:FVW B5@0?VW.

V:C20==O ?@5?0@0B< ?@8 70E2>@N20==OE ?5GV=:8 1C45 1V;LH 5D5:B82=8< ?@8 4>B@8 <0==V 4VTB8 B0 CB@8<0==O 2V4 70AB>AC20==O 0;:>3>;N, C=8:0B8 26820==O 68@=>W W6V, OTFL, H>:>;04C.

>15@56=VABN A;V4 70AB>A>2C20B8 ?@5?0@0B ?@8 70E2>@N20==OE, I> <>6CBL ?@8725AB8 4> =5?@>EV4=>ABV 6>2G>282V4=8E H;OEV2.

!;V4 7 >15@56=VABN ?@87=0G0B8 ?@5?0@0B ?0FVT=B0<, E2>@8< =0 FC:@>289 4V015B B0 ?0FVT=B0< 7 3V?>3;V:51EV4=> ?@>2>48B8 <=>VB>@8=3 @V2=O FC:@C 2 :@>2V 4;O :>=B@>;N 3V?>3;V:5W 4VW ?@5?0@0BC.

@8 B@820;>AC20==V ?@5?0@0BC 7=86CTBLAO @V25=L 07>B>228= B0 E>;5AB5@8=C 2 :@>2V. 5>1EV4=VABL ?@>2545==O ?>2B>@=8E :C@AV2 ;V:C20==O 2AB0=>2;NT ;V:0@ V=482V4C0;L=>.

/:I> A8<8 70E2>@N20==O =5 7=8:0NBL 01> ?>ABV9=> @5F8482CNBL 01> C @07V 28=8:=5==O 4V0@5W, 1>;N C 682>BV, 0;5@3VG=8E @50:FV9, ;V:C20==O ?@5?0@0B< A;V4 ?@8?8=8B8 B0

725@=CB8AO 4> ;V:0@O.

0AB>AC20==O C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N.

@>B8?>:070=> 70AB>A>2C20B8 C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N.

40B=VABL 2?;820B8 =0 H284:VABL @50:FVW ?@8 :5@C20==V 02B>B@0=A?>@B< 01> V=H8<8 <5E0=V7<0<8.

0FVT=B0< 7 VA=CNG8<8 25AB81C;O@=<8<8 ?>@CH5==O<8 =5>1EV4=> 7 >15@56=VABN
70AB>A>2C20B8 ?@5?0@0B ?@8 :5@C20==V 02B>B@0=A?>@B< 01> V=H8<8 <5E0=V7<0<8.

!>AV1 70AB>AC20==O B0 4>78.

@>89<0B8 2=CB@VH=L> 4>@>A;8< B0 4VBO< 2V:< 2V4 12 @>:V2 ?> 1-2 B01;5B:8 2 @078 =0 4>1C
?V4 G0A 01> ?VA;O W48.

"5@ 2V4 E0@0:B5@C 70E2>@N20==O. 0728G09 :C@A ;V:C20==O AB0=>28BL 3-6 B86=V2.

VB8.

@>B8?>:070=> 70AB>A>2C20B8 4VBO< 2V:< 4> 12 @>:V2.

5@54>7C20==O.

@07V ?5@54>7C20==O <>6;825 ?>A8;5==O ?>1VG=8E @50:FV9.

>6;8289 @>728B>: 4V0@5W. @0E>2CNG8 =0O2=VABL C A::04V ?@5?0@0BC ;8>==8:0 :8B09AL:>3> V
B0C@8=C, ?@8 ?5@54>7C20==V <>6;825 ?5@571C465==O =5@2>2>W B0 A5@F52>-AC48==>W A8AB5
< (<>6;82V 0@B5@V0;L=0 3V?5@B5=7VO, 0@B5@V0;L=0 3i?>B5=7iO, B0EV:0@4VO,
457>@VT=B0FVO).

V:C20==O: ?@><820==O H;C=:0, ?@87=0G5==O 0:B82>20=>3> 2C3V;;O. "5@0?VO A8<0B8G=0.

>1VG=V @50:FVW.

@8 V=482V4C0;L=V9 =5?5@5=>A8<>ABV B0 ?V428I5=V9 GCB;82>ABV <>6;8289 @>728B>: ?>1VG=8E
@50:FV9.

1>:C VW A8AB5<8: @50:FVW 3V?5@GCB;82>ABV, 2:;NG0NG8 0=0DV;0:B8G=89 H>:.

1>:C H:V@8: 3V?5@5A8;5==O 0;>?5FVW.

I>:C B@02=>3> B@0:BC: 7=865==O 0?5B8BC, 0=>@5:AVO, ?5GVO, 48A?5?AVO,1;N20==O, =C4>B0,
<5B5>@87<, 4V0@5O (C B. G. 2=0A;V4>: 6>2G>3V==>W 4VW ?@5?0@0BC), A?07<8 :8H5G=8:C, 0
B0:>6 1V;L C 25@E=V9 G0AB8=V 682>B0, 7B=>ABV H;C=:0.

I>:C =5@2>2>W A8AB5<8: 3>;>2=89 1V;L, ?>@CH5==O A=C, 157A>==O.

I>:C A5@F52>-AC48==>W A8AB5<8: B0EV:0@4VO, ?V428I5==O 0@B5@V0;L=>3> B8A:C.
=HV: ?>A8;5==O 4VC@57C, <>65 2V47=0G0B8AO ?>A8;5==O VA=CNG8E 25AB81C;O@=8E
?>@CH5=L, 7048H:0.

"5@ABV.

4 @>:8.

#<>28 715@V30==O.

15@V30B8 C 70E8I5=>

15@V30B8 C =54>ABC?=>

#?0:>2:0.

> 15 B01;5B>: C 1;VAB5@V, 2 01> 8 1;VAB5@V2 C :0@B>==V9 ?0GFV.

0B53>@VO 2V4?CA:C. 57 @5F5?B0.

8@>1=8:.

2AB@0;V0= \$0@<0ALNBV:0; 0=CD5:BC@5@A BV B4.

VAF57=0E>465==O 28@>1=8:0 B0 9>3> 04@5A020465==O 4VO;L=>ABV.

25 V:5@V=3 >C4, 0;3@592 V:B>@VO 3170, 2AB@0;VO